

II. Rejection Under 35 U.S.C. §102

Claims 1, 2 and 5 stand rejected as anticipated by JP 634014. The Examiner asserts that the thickener of JP '014 swells in an alkaline medium.

Applicants respectfully direct the Examiner's attention to JP '014, at page 5, paragraph 8, wherein the thickeners are described as "carboxylated acrylic type, styrene/acrylic type, or butadiene type." Ink compositions containing the thickeners of JP '014 require the presence of an alkali agent, as stated at page 4, paragraph 7 of JP '014. Further, JP '014 states at page 4, lines 9-12 that the alkali agent should be present in an amount sufficient to produce a composition with a pH of 8 or higher.

In contrast, the claims require a "thickener which is associative and swells in an alkaline medium."

Applicants assert that the claimed thickener is different than the thickeners described in JP '014, and respond below to each of points (a) to (c) raised by the Examiner in paragraph 8 of the February 20, 2001 office action.

Applicants dispute the Examiner's statements in points (a) and (b) that the specification does not distinguish Primal RM-5 from the claimed thickeners. The Examiner states that the specification:

. . . does not state that RM-5 is not associative, rather it states that RM-5 has little associative property. The present claims only require that the thickener is associative, regardless of the degree to which it associates.

Applicants submit that the remainder of the paragraph at page 10, lines 4-8 makes clear that the RM-5 thickener is not contemplated to be a thickener used

in the invention. The specification states that RM-4 and RM-5 "do not have the thickening actions described above." The text which is directly "above" the paragraph referenced by the Examiner, from page 9, line 12 to page 10, line 3, clearly describes the thickeners of the invention. The text begins, at page 9, line 12, as describing "[t]he alkali swelling associative thickener *used in the present invention* . . ." (Emphasis added). At page 9, lines 19-24, the specification recites specific resins which are examples of the thickeners.<sup>1</sup> The remaining text, at page 10, lines 4-8, distinguishes the thickeners RM-4 and RM-5 from the thickeners described above, and thus by definition the "thickeners of the invention."

In point (c), the Examiner refuses to consider the comparative data of comparative Example 4 on the grounds that "there is not proper side-by-side comparison of inks prepared using thickeners of the present invention versus inks prepared using Primal RM-5." In response, attached is a Declaration Under 37 C.F.R. §1.132 of inventor Masaru Miyamoto, which describes preparation of an ink composition according to the procedure used in the Examples in the specification, at pages 15-24. The thickener used was a 10% aqueous solution of Primal RM-5<sup>2</sup>, which is distinguished in the specification of this application, at page 10, lines 4-8, from the claimed thickeners.

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<sup>1</sup> The recited resins include Primal TT-935 and Primal TT-615, which are included in the Example ink compositions of the invention.

<sup>2</sup> The Examiner is respectfully advised that Primal RM-5 and Acrysol RM-5 are the same product, manufactured by Rohm & Haas. Primal is the trade name in Japan for Acrysol.

The Examiner is reminded that Primal RM-5 is described in JP '014 (see page 5, line 15). The amount of Primal RM-5 used in JP '014 is identical to the amount in Examples 2, 4 and 8 of the specification.

The Declaration demonstrates that compositions containing Primal RM-5 have a reduction in viscosity, and inferior ink-seeping, resistance and writing properties, in comparison to the Examples from the specification, using the claimed associative thickener.

In point (c), the Examiner also states that "the inventive examples 1-8 which use 3, 4, 6 and 8% thickener are not reasonably commensurate in scope with the scope of the present claims especially, claim 5, which requires 0.1-2% thickener."

In response, the Examiner is respectfully advised that the Examples use a 10% aqueous solution of the thickener, and therefore the weight percent of thickener in the examples is commensurate with the scope of the claims.

Thus, the claimed "thickener which is associative and swells in an alkaline medium" is different than the carboxylated acrylic type, styrene/acrylic type, or butadiene type thickeners described in JP '014. As a result, JP '014 does not anticipate the claimed invention.

In view of the arguments made, it is respectfully submitted that claims 1, 2 and 5 are not anticipated by JP '014, and it is respectfully requested that the rejection be withdrawn.

III. Rejection Under 35 U.S.C. §103

Claims 1, 2 and 5 are rejected as obvious over Okumura *et al.* (U.S. Patent No. 5,580,374) either alone or in view of Doolan *et al.* (U.S. Patent 5,425,806) and Shay *et al.* ( U.S. Patent No. 5,478,602).

Claims 3 and 4 are rejected as obvious over Okumura *et al.* either alone or in view of Doolan *et al.* and Shay *et al.* as applied to claim 1 and 2 and further in view of either Kobayashi *et al.* ( U.S. Patent No. 4,822,417) or JP54138732. Claims 3 and 4 also continue to be rejected as obvious over JP 6346014 in view of either Kobayashi *et al.* or JP 54138732.

The Examiner has previously asserted (in the Office Action mailed June 2, 2000) that Okumura describes thickeners which are polymers containing carboxyl groups and hydrophobic groups. It is believed that the Examiner is relying on polycarboxylic acid thickeners such as acrylic resin, poyacrylic resin, polymethacrylic resin, vinyl acetate and crotonic acid (see col. 6, l. 20-28, of Okumura). The Examiner is respectfully advised that typical polycarboxylic acid thickeners are alkali neutralization type thickeners whose viscosity is reduced in an alkali medium. Enclosed at Exhibit A as evidence of the surprising differences between the claimed thickeners and the polycarboxylic acid thickeners of the Okumura is an excerpt from a brochure for Primal TT-615 (or Acrysol TT-615), which is an thickener of the type claimed (Primal TT-615 is recited in the specification of this application at page 9, line 23, and is used in Examples 3-7 of the invention). The brochure demonstrates the improved viscosity profile in the claimed thickener Primal TT-615, in comparison to

typical polycarboxylic acid thickeners. Primal TT-615 demonstrates a continued increase in viscosity over the pH range 7.5 to 12.0, whereas the polycarboxylic acid thickeners do not demonstrate an increase in viscosity in the pH ranges of 7.5 to 12.0. Thus, the claimed thickeners do not lose efficiency with increasing pH.

The Examiner's attention is also directed to the Declaration of Miyamoto, which demonstrates the unexpected favorable results of the claimed thickeners in comparison to typical polycarboxylic acid thickeners such as Primal RM-5.

In view of the above, since Okumura only describes polycarboxylic acid thickeners and does not describe or suggest a "thickener which is associative and swells in an alkaline medium," claims 1-5 are not obvious over the combination of Okumura and the secondary references.

In addition, the Examiner relies on Kobayashi for teaching the use of pigments surface treated with resins. Kobayashi describes oil soluble ink compositions, containing oil soluble dyes and pigments. Kobayashi does not describe or suggest the use of pigments surface treated with resins in aqueous compositions.

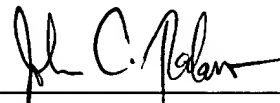
In view of the arguments made, it is believed that the above referenced anticipation and obviousness rejections have been overcome. It is respectfully requested that the rejections be withdrawn.

IV. Conclusion

In view of the foregoing, it is believed that claims 1-5 are neither anticipated by nor obvious over the art of record. Claims 1-5 are believed to be in condition for allowance.

Favorable action is earnestly solicited.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "John C. Todaro", is written over a horizontal line.

John C. Todaro  
Reg. No. 36,036  
Attorney For Applicant(s)

DARBY & DARBY P.C.  
805 Third Avenue  
New York, NY 10022  
(212) 527-7700

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Rohm & Haas Japan Co. Ltd.

ローム・アンド・ハース・ジャパン 株式会社

東京本社:東京都港区麻布台1-8-10 偕成ビル TEL:03(583)9461

大阪支店:大阪市淀川区西中島5-14-10 リクルート新大阪  
TEL:06(308)7861

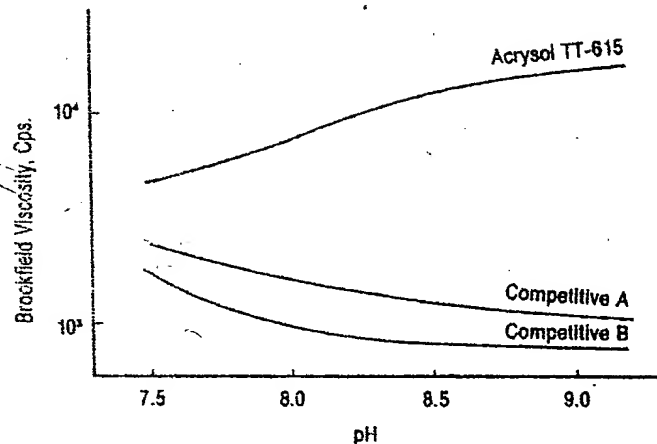
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プライマルTT-615と他のポリカルボン酸系増粘剤を比較すると、後者は高い pH 領域では効果が減少する事です。(図-3)

図-3 プライマル TT-615の中和粘度

4-Acrysol TT-615 emulsion has an advantage over many other carboxylic acid thickeners in that it does not lose efficiency with rising pH. As its viscosity profile shows, Acrysol TT-615 actually thins most effectively in the pH range between 7.5 and 12.0. In contrast, efficiency of most conventional polycarboxylic acid products falls off in this range, as the viscosity profiles for two of them (A,B) demonstrate.



この性質は種々な処方で使用されているアルカリ系ポリマーに対して有効です。プライマルTT-615が広い pH 領域で使用出来る事は一般のポリカルボン酸系増粘剤よりも樹脂の選択性が少ない事を意味しています。

加えるにプライマルTT-615エマルジョンは、色々な方法で添加出来ます。プライマルTT-615は稀釈、中和そして混合系へと添加する事が出来ます。次の方法としては、稀釈、混合系へ添加、そして系内で中和する。最後の方法は稀釈、中和する事なく直接レットダウン系にゆっくりと添加し、十分に攪拌する事により混合させる事が出来ます。この添加方法の多様性は塗料製造方法に柔軟性を附与致します。

プライマルTT-615は他のポリカルボン酸系増粘剤に対してもう一つの優れた性質を持っています。大部分のポリカルボン酸系増粘剤はカルシウムやナトリウムの様な金属イオンが同時に存在する事は全く不可能です。これらのイオンは、アニオン系増粘剤の荷電による反発という機能を奪い取ってしまいます。そして、もし系にイオンを含む塗料処方の場合、多くの問題が発生します。

プライマルTT-615エマルジョンはポリカルボン酸系であり、カルボキシ基の荷電反発で増粘効果が現われます。その他は多価イオンに対して抵抗のある機構により増粘致します。その結果プライマルTT-615は、一般的な塩に対して非常に安定です。

(図-4を参照して下さい)。この新規増粘剤プライマルTT-615は、塗料配合を検討する上で研究者の選択すべき原材料の種類を多様化します。そして、反応によって発生するかもしれない塩による系の不安定化に対する危惧を除き去るでしょう。



プライマル TT-615 と他のポリカルボン酸系増粘剤を比較すると、後者は高い pH

領域では効果が減少する事です。(図-3)

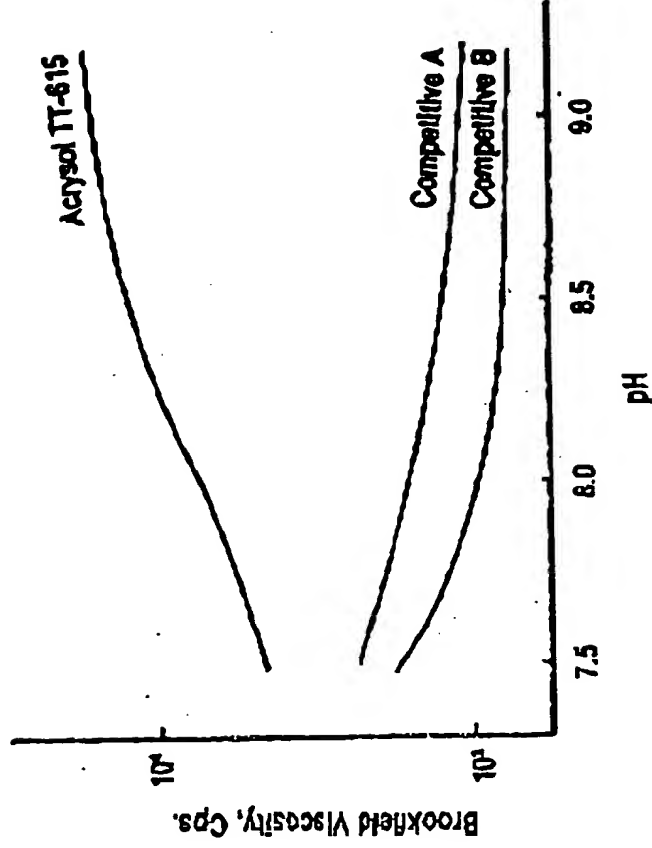
In comparison of Primal TT-615 with other polycarboxylic acid base thickeners, the latter reduces in the effect in the high pH range.

図-3 プライマル TT-615 の中和粘度

Fig. 3 Primal TT-615 neutralized viscosity

4-Acrysol TT-615 emulsion has an advantage over many other carboxylic acid thickeners in that it does not lose efficiency with rising pH. As its viscosity profile shows, Acrysol TT-615 actually shows most effectively in the pH range between 7.5 and 12.0. In contrast, efficiency of most conventional polycarboxylic acid products falls off in range, so the viscosity profiles for two of them (A, B) demonstrate.

Acrysol TT-615 emulsion has an advantage over many other polycarboxylic acid thickeners in that it does not lose efficiency with increasing pH. As its viscosity profile shows, Acrysol TT-615 actually functions most effectively in the pH range between 7.5 and 12.0. In contrast, the efficiency of most conventional polycarboxylic acid products falls off in said range, as the viscosity profiles for two of them (A, B) demonstrate.



IN RE APPLICATION OF: :

Masaru MIYAMOTO : GROUP ART UNIT: 1714

SERIAL NO.: 09/297,399 : EXAMINER: SHOSHO, C.

FILED: April 29, 1999

For: WATER BASED INK COMPOSITION FOR BALLPOINT PEN

Honorable Commissioner of Patents and Trademarks  
Washington, D.C. 20231

**DECLARATION UNDER 37 C.F.R. § 1.132**

SIR:

Now comes Masaru MIYAMOTO, who deposes and states that:

1. I am the inventor of the subject matters described and claimed in the above-identified application.
2. I am a graduate of the Department of Industrial Chemistry of Kogakuin University in March 1980.
3. I have been employed by Mitsubishi Pencil Kabushiki Kaisha since September, 1985 and have been conducting research and development in the field of ink.
4. I am familiar with the prosecution of the present application, particularly the Official Action mailed February 20, 2001 in which the Examiner rejected the claims in the above-identified application under 35 U.S.C. 102(b) and 103(a) by and over references of the prior art.

In order to evidence that thickeners used for the present invention produce the excellent effects compared with a thickener that is not associative in an alkali medium, I submit the experiment data as an additional comparative example.

(1) Preparation of ink composition

An ink composition was prepared in the same manner as Examples in the specification at the recipe shown in the following table.

(2) Thickening of ink composition

A 10 % aqueous solution of Primal RM-5 (manufactured by Rohm & Haas Co. Ltd.) was prepared, and 6.0 parts by weight thereof was added to the ink composition prepared at the ink-preparing step and sufficiently blended by means of a stirrer until homogeneous solution was obtained. Finally, coarse particles were removed once again by filtering, whereby a water based ink composition for a ballpoint pen was obtained.

(3) The same tests as in the Examples in the specification were carried out by using the above thickened ink composition.

The results are shown in the following table as comparative Example 5.

(4) The amount used of 6.0 parts by weight is equal to the amount of the associative thickener used in Examples 2, 4 and 8 in the specification.

As apparent from the Table, the ink composition containing 6.0 parts by weight of Primal RM-5 has a small viscosity of 58 mPa·S and changes in the pigment particles over an extended period of time, which are different from the ink composition prepared in Examples. Further, the ink composition of comparative Example 5 is inferior in ink-seeping resistance and writing property.

Table

	Comparative Example		Comparative Example
	5		5
<u>Dispersion step</u>		<u>Ink-preparing step</u>	
Carbon black	8.0	Phosphoric acid ester	0.5
Naphthol red		Aminomethylpropanol	0.1
Styrene-maleic	6.0	Propylene glycol	15.0
acid 30 % aqueous solution		Water	28.0
Aminomethylpropanol	0.2	Rust preventive and fungicide	0.4
Propylene glycol	5.0		
Water	30.8		

	Comparative Example
	5
<u>Thickening</u>	
Primal RM-5 *1	6.0
<u>Test items</u>	
Pigment initial particle diameter ( $\mu\text{m}$ )	108
Pigment particle diameter after 6 month ( $\mu\text{m}$ )	215
Viscosity of ink ( $\text{mPa} \cdot \text{s}$ )	58
Ink-seeping resistance	×
Writing property	△

\*1) Primal RM-5 was diluted with water to adjust a polymer component to 10%

5. I declare further that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of this application or any patent issued thereon.

August 9, 2001

Date

A handwritten signature in cursive script, reading "Masaru Miyamoto", written in dark ink.

Masaru MIYAMOTO